OEHHA Distinguished Lectures: Advances in Toxicology and Risk Assessment

INAUGURAL SERIES 2008: EPIGENETICS AND ENVIRONMENTAL DISEASES

The Office of Environmental Health Hazard Assessment (OEHHA) is hosting a Distinguished Lecture Series on Advances in Toxicology and Risk Assessment. These lectures are intended to promote a better understanding of key emerging scientific issues with the aim of improving risk assessment. Preeminent researchers in toxicology and other disciplines in environmental health have been invited to present their findings and discuss their application to risk assessment. All the lectures will be held in Sacramento and simultaneously webcast on the website of the California Environmental Protection Agency (http://www.calepa.ca.gov/Broadcast) or on the website that will be specified in the announcement before each lecture. The lectures will begin at 10 am on the scheduled dates and are open to the public at no cost. No registration is required. More information about the series is available at: http://www.oehha.ca.gov.

The theme for the series in 2008 is Epigenetics and Environmental Diseases. This series will focus on epigenetic mechanisms that may be involved in the development of common human diseases such as neurodevelopmental disorders, breast cancer, male infertility, prostate illness, and cardiovascular illness. The first six lectures have been scheduled. Brief introductions to each lecture and the speaker are presented below.

HOSTS Dr. Joan E. Denton, Director, OEHHA
Dr. George V. Alexeeff, Deputy Director for Scientific Affairs, OEHHA

EPIGENETICS: THE INTERFACE BETWEEN ENVIRONMENT AND THE GENOME
WEDNESDAY, FEBRUARY 20, 2008

Location: City Council Chamber, New City Hall, 915 I Street, Sacramento, CA
Speaker: Shuk-Mei Ho, Ph.D., University of Cincinnati, Cincinnati, Ohio

Dr. Ho is the Chair of the Department of Environmental Health at the University of Cincinnati Medical School. She is an expert in hormonal carcinogenesis and steroid hormone action. Dr. Ho utilizes genomic, epigenomic, proteomic, and bioinformatic analyses for the discovery of diagnostic and prognostic markers for human diseases and for the prediction of patients' responses to interventions. In addition, her current programs emphasize mechanisms of fetal-based adult disease development, cadmium-induced disorders, and oxidative stress/inflammation-mediated cellular changes. In her inaugural lecture, Dr. Ho will present fundamental theories governing laboratory techniques that have been commonly used in epigenetic research. She will highlight epigenetic mechanisms that have been recognized to be involved in the development of common human diseases. She will also present recent findings that shed light on how environmental chemicals can alter biological systems through epigenetic mechanisms.

DEVELOPMENTAL ORIGINS OF DISEASE AND DYSFUNCTION: ROLE OF ENVIRONMENTAL EXPOSURE
WEDNESDAY, FEBRUARY 27, 2008

Location: City Council Chamber, New City Hall, 915 I Street, Sacramento, CA
Speaker: Jerrold J. Heindel, Ph.D., NIEHS/NIH, Research Triangle Park, NC

Dr. Heindel is the scientific program administrator at the Extramural Research and Training Division of National Institute of Environmental Health Sciences (NIEHS) and led the efforts at the NIEHS in developing the research program on the developmental origins of health and disease (DOHaD). Dr. Heindel will present an overview of the scientific basis for the DOHaD concept. He will discuss existing experimental data on how nutritional deficits and exposure to environmental chemicals during development can increase susceptibility to cancer, infertility, obesity and metabolic syndrome, and cardiovascular and neurodegenerative diseases. Dr. Heindel will review epigenetic and other molecular mechanisms of altered gene expression induced by chemicals, how this affects imprinting during development, and ultimately makes the affected organ systems more susceptible to disease later in life.

ENVIRONMENTAL INFLUENCES ON MAMMARY GLAND DEVELOPMENT AND FUNCTION
THURSDAY, APRIL 17, 2008

Location: City Council Chamber, New City Hall, 915 I Street, Sacramento, CA
Speaker: Suzanne E. Fenton, Ph.D., U.S. EPA, Research Triangle Park, NC

Dr. Fenton is a Research Biologist at the US Environmental Protection Agency's Reproductive Toxicology Division. Her current research involves identification of the effects of environmental components on early development, pubertal timing and lactational function of the mammary gland. Dr. Fenton will review the endocrine control of mammary gland development in male and female rats and focus on how perinatal exposure to environmental chemicals disrupts mammary gland development, especially in relationship to pubertal timing. The mammary gland undergoes incredible growth during the perinatal period. Exposures in late pregnancy can affect mammary gland development. There are several chemicals that demonstrate persistent effects on the gland following early life exposure. This can lead to malnutrition in a second unexposed generation and to increased susceptibility to mammary carcinogens. Dr. Fenton will provide examples of these permanent changes and the long-term impact of those effects.

EPIGENETIC MECHANISMS IN AUTISM SPECTRUM DISORDERS
TUESDAY, MAY 22, 2008

Location: Sierra Hearing Room, California EPA, 1001 I Street, Sacramento, CA
Speaker: Janine LaSalle, Ph.D., University of California, Davis, CA

Dr. LaSalle is a Professor in Microbiology and Immunology and the Rowe Program in Human Genetics at UC-Davis. Her research focuses on the role epigenetics in human autism-spectrum disorders. Dr. LaSalle is investigating the role of methyl CpG binding protein 2(MeCP2) in the regulation of gene expression the organization of parentally imprinted chromosomes, and how MeCP2 interacts with organic pollutants during neurodevelopment. Dr. LaSalle will focus on the importance of epigenetics to the developing human brain, as revealed by known autism-spectrum genetic disorders that disrupt these pathways. She will also discuss how potential environmental factors could alter epigenetic patterns and pathways. She will present preliminary studies on whether the rising prevalence of autism-spectrum disorders in California and the U.S. can be explained by increased exposures to the polybrominated diphenyl ether flame retardants.

GENE PATHWAYS TARGETED DURING PHTHALATE-INDUCED TESTICULAR DYSGENESIS
TUESDAY, JUNE 24, 2008

Location: Sierra Hearing Room, California EPA, 1001 I Street, Sacramento, CA
Speaker: Kevin W. Gaido, Ph.D., The Hamner Institutes for Health Sciences, Research Triangle Park, NC

Dr. Gaido is a Senior Investigator and Director of the Center for Integrated Genomics at The Hamner Institutes for Health Sciences. Dr. Gaido has conducted numerous studies on the adverse effects of environmental chemicals on the male reproductive system. His research incorporates the use of genomic technologies with in vitro and in vivo models of endocrine action. His recent findings on gene pathways that are involved in phthalate-induced testicular dysgenesis will be presented. One of the earliest testicular changes observed after phthalate exposure is an alteration in expression of numerous genes. The common targeting of these genes by certain phthalates indicates a role for their associated molecular pathways in testicular development. Phthalate esters serve as useful compounds for elucidating the role of these genes in normal testicular development and testicular dysgenesis.

EARLY LIFE ESTROGEN EXPOSURES ALTER THE PROSTATE EPIGENOME AND INCREASE CANCER RISK
WEDNESDAY, JULY 23, 2008

Location: Sierra Hearing Room, California EPA, 1001 I Street, Sacramento, CA
Speaker: Gail S. Prins, Ph.D., University of Illinois, Chicago, IL

Dr. Prins is a Professor of Physiology in the Departments of Urology and Physiology and Biophysics at the University of Illinois at Chicago. Dr. Prins' basic research focuses on hormonal regulation of prostate gland growth and carcinogenesis. Dr. Prins will present her findings that indicate early life exposure to natural, synthetic or environmental estrogens, such as low levels of bisphenol A, increase susceptibility to precancerous prostate gland lesions with aging. Permanent DNA methylation changes were identified in several prostatic genes involved in cell signaling, resulting in altered expression throughout life. The possibility that neonatal estrogen reprogramming of adult prostatic disease susceptibility may be mediated through epigenomic alterations which promote prostate disease in the aging male will be discussed.

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WEBCAST INFORMATION
http://www.calepa.ca.gov/Broadcast/ and then click on the link to OEHHA Distinguished Lecture Series. To submit questions or comments while viewing the webcast, send emails to lli@oehha.ca.gov.